

Comparison of Two Rare Cowrie Species (Gastropoda)

BY

CRAWFORD N. CATE

Conchological Club of Southern California, Los Angeles 7, California

(Plates 1, 2, 3, 4; 2 Textfigures)

The need for modern illustrations to resolve the confusion between *Cypraea* (*Zoila*) *venusta* Sowerby, 1846, and *C. (Z.) episema* Iredale, 1939, became apparent to me recently after studying several specimens that seemed identical, though according to their labels, representing both species. Upon comparing these specimens very closely with one in my collection labelled *C. venusta* (see Plates 1 and 2, Figs. 1a, 1b), and verifying the identities of both species through pertinent literature, I realized that no really adequate modern figure of either had been published. Iredale (1939, Pl. 27, Figs. 3, 4) provided photographs of dorsal and ventral views of *C. episema* (reproduced here on Plate 3, Figs. 1a, 1b), but these were unfortunately somewhat blurred in the original reproduction. Allan (1956, Pl. 13, Fig. 1) represented only *C. venusta*, with drawings that do not clearly indicate the detail it is possible to portray in a photographic illustration. Schilder (1960, Pl. 14, Fig. 1) figured *C. episema* with good photographs of dorsal and lateral views, but the ventral aspect, which is the most important for the purpose of distinguishing between *C. episema* and *C. venusta*, is lacking. Weaver (1961, p. 5) illustrated the specimen of *C. venusta* used in this study with three well-reproduced photographs. Aside from the above-mentioned modern figures, one must refer to Sowerby (1870, Pl. 2, Figs. 5, 6), Cox (1869, p. 358, Pl. 26, Figs. 1, 1a), Cox (1889, p. 187, Pl. 15, Figs. 1, 2), Weinkauff (1881, Pl. 20, Figs. 6, 7), and Tryon (1885, p. 176, Pl. 10, Figs. 44, 45) for the only other illustrations of either species that I have been able to locate in the literature. The purpose of this paper is to trace the references to *C. venusta* and *C. episema*, and to illustrate both species as fully as possible, with special emphasis on pointing out the differences be-

tween them.

I have been fortunate in being able to examine at first-hand eight specimens of *Cypraea episema*. This unusual opportunity has been made possible through the kindness of Mr. William E. Old of the American Museum of Natural History (Plate 2, Figs. 2a, 2b), Mr. E. L. Fobes of Omaha (Plate 2, Figs. 3a, 3b), and Mr. Clifton Weaver of Honolulu (Plate 3, Figs. 2a, 2b), all of whom have loaned their specimens for study. Mr. Ray Summers of Petaluma, California, also allowed me to study and measure the specimens in his collection, and Mrs. Thelma Hartley of Melbourne kindly provided color transparencies and the approximate measurements of specimens in her collection. The other shells observed are in my own collection, including the *C. venusta* which I purchased from Mr. Weaver; the measurements and locality data for all specimens used are included in Table I. I had hoped to secure photographs of the holotype of *C. venusta* for inclusion here, but due to the re-organizational work now being done at the British Museum (Natural History) it was not possible to do so.

Cypraea venusta and *C. episema* are closely related species of the subgenus *Zoila* Jousseaume, 1884, which is characterized chiefly by weakly developed apertural teeth and by frequently incomplete series of columellar teeth. Other species or subspecies assigned to this subgenus at the present time are *C. friendii* Gray, 1831 (type species), *C. thersites* Gaskoin, 1848, *C. marginata* Gaskoin, 1848, *C. decipiens* Smith, 1880, *C. vercoi* Schilder, 1930, *C. contraria* Iredale, 1935, and *C. rosselli* Cotton, 1948. All are of uncommon to rare occurrence, most are deep water species, and all are restricted to western and southern Australia.

The present taxonomic position of *Cypraea venusta* is as follows:

- CYPRAEIDAE FLEMING, 1828 (em.)
 Cypraeinae STOLICZKA, 1867
Cypraea LINNAEUS, 1758
Zoila JOUSSEAUME, 1884
venusta SOWERBY, 1846

Synonyms:

- Cypraea thatcheri* COX, 1869
Cypraea roseopunctata MELVILL, 1888 (*nom. nud.*)
Cypraea brunea COX, 1889
Cypraea venusta var. *brunea* [COX] HIDALGO, 1906
Cypraea venusta var. *bakeri* GATLIFF, 1916

Because of the unavailability to most collectors of the early volume of the Journal of the Linnean Society of London containing Sowerby's

original description, I include here a copy of the original Latin description, and a literal translation into English which was generously furnished by Mr. George P. Kanakoff of the Los Angeles County Museum.

Cypraea venusta, testâ ovato-ventricosâ utrâque extremitate anticâ praecipuè subrostratâ, dorso gibboso carnicolorum maculis pallidè castaneis notato, lateribus basalibus incrassatis carnicoloribus, extremitatibus pallidè castaneis roseo-tinctis, basi subplanulatâ albicante extremitatibus carnicoloribus, spirâ validâ obtusâ anfractibus duobus, aperturâ elongatâ angustâ rectiusculâ intus roseâ posticè in canalem brevem sinistrallem exeunte anticè subflexuosâ, canali anticâ brevi rectiusculâ paululùm deflexâ, dentibus labii externi circa 25 magnis interstitiis aequalibus rotundatis; labii interni paucis (circa 16) majoribus distantibus anticis maximis medianis ferè obsoletis, cavitate columellari parvâ albâ.

Table 1.

Measurements (in millimeters) of specimens used in this study						
Specimen and locality*	Length	Width	Height	Teeth columella	Teeth outer lip	In the collection of:
<i>Cypraea venusta</i> SOWERBY, 1846 Hypotype 1	75.7	49.4	39.8	16	23	C. N. Cate (No. 563) leg. Max Cramer
<i>Cypraea episema</i> IREDALE, 1939						
Hypotype 1	78.7	48.4	42.0	6 (4)	24	Am. Mus. Nat. Hist. (No. 84 083)
Hypotype 2	76.2	48.1	39.6	6 (2)	19 (1)	E. L. Fobes
Hypotype 3 (subadult)	53.0	34.6	27.8	6 (4)	19 (4)	C. N. Cate (No. 1461) leg. M. Cramer
Hypotype 4	63.0	40.0	32.5	6 (1)	21	C. S. Weaver; leg. Max Cramer
Hypotype 5	80.9	49.5	43.1	6 (3)	24	Ray Summers
Hypotype 6	79.4	51.5	43.8	6 (2)	25	Ray Summers
Hypotype 7	74.6	49.5	40.3	6 (2)	27	Ray Summers
Hypotype 8	57.4	36.4	29.4	6 (1)	22	Ray Summers
Hypotype 9	65.0	43.0	32.0	7	20	Thelma Hartley
Hypotype 10	58.0	36.0	30.0	8	20	Thelma Hartley; leg. Barry Wilson
Hypotype 11	61.0	41.0	33.0	8	21	Thelma Hartley; leg. Barry Wilson
Hypotype 12	60.9	40.1	32.9	6 (4)	25	C. N. Cate (No. 1515); leg. B. Wilson
Hypotype 13	60.0	39.5	32.0	6 (4)	21	Max Cramer; leg. Max Cramer

(4) denotes faint, immature teeth

* localities

Cypraea venusta SOWERBY, 1846

- Hypotype 1 West Wallaby Island, Houtman
 Abrolhos Group
 (washed ashore west side of island, 1960)

Cypraea episema IREDALE, 1939

- | | | | |
|------------|--|-------------|---|
| Hypotype 1 | 25 fathoms, Geographe Bay | Hypotype 8 | Sorrento Reef, Perth |
| Hypotype 2 | 40 feet, Geographe Bay off Dunsboro, near Cape Naturaliste, 1957 | Hypotype 9 | North Western Australia, exact locality unknown. Subfossil specimen |
| Hypotype 3 | 25 to 30 feet, on ceiling of cave, Sorrento Reef, Perth | Hypotype 10 | 10 to 25 feet, Sorrento Beach, north of Fremantle. July 1, 1962 |
| Hypotype 4 | With hypotype 3 | Hypotype 11 | With hypotype 10 |
| Hypotype 5 | 15 feet, Geographe Bay; July 1960 | Hypotype 12 | With hypotype 10 |
| Hypotype 6 | Geographe Bay, 1957 | Hypotype 13 | Sorrento Reef, limestone slab in soft green sponge |
| Hypotype 7 | Geographe Bay | | |

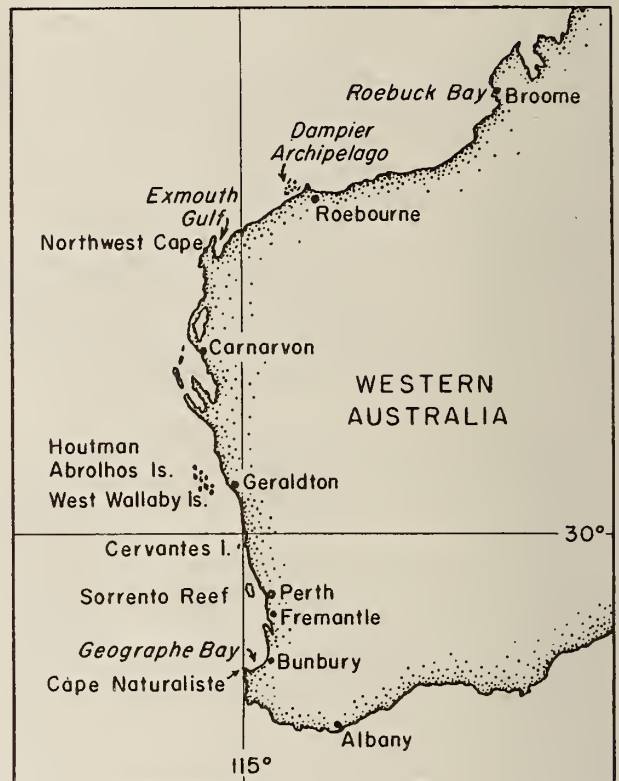
Shell ovate-ventricose, abruptly beaked at both ends; dorsal surface convex, flesh-colored and spotted with pale chestnut brown, lateral sides thick, flesh-colored, paler at the extremes, of more chestnut-rose color; base flattened, whitish and flesh-colored at ends; spire strongly obtuse with two whorls; aperture elongate, narrow, rather straight, inside rose-pink; the posterior canal short, sinistral; dentition of outer lip approximately 25 large subequal interstices; the inner lip with 16 teeth larger and more distant at ends and almost obsolete in the middle; columellar cavity small and white.

Sowerby adopted the name *Cypraea venusta* from an unpublished manuscript by Gaskoin, the whereabouts of which is unknown. The name had been associated with a unique specimen in the Saul Collection, but evidently was not published until Sowerby did so in 1846. In describing this species Sowerby provided no type figure, and specified no type locality as such, though he added this comment: "A very handsome Cowry, of which a single specimen has lately been received from Port Adelaide, South Australia." Sowerby may have recognized that Port Adelaide quite possibly was not the exact locality where the specimen had been collected, and our present knowledge of the range of the species supports his seeming hesitancy to cite it specifically.

It seems appropriate here to summarize the various references to *Cypraea venusta* and *C. episema* in their chronological sequence, to broaden the understanding of the literary histories of these species.

In 1847, one year after Sowerby's original publication of *Cypraea venusta*, his description was reprinted, word for word, in the *Annals and Magazine of Natural History*. This reference is sometimes erroneously cited as the basis for the species, but the date of actual publication of *C. venusta* was one year earlier. No illustration was furnished in either.

Cox (1869) described and figured *Cypraea thatcheri* (= *C. venusta* Sowerby) from two specimens collected 10 years earlier somewhere in the Dampier Archipelago, listing the measurements as: "L. 3 inches, W. 1 15/16, H. 1 11/16." Following his rather detailed description, Cox further stated: "The two specimens of this beautiful species now before me, one of which I send to be figured, were obtained by Mr. C. R. Thatcher, from a fisherman who took them at the locality above recorded, about ten years ago; and, so far as I know, no other specimens have yet been found. The two specimens are exactly alike in every way, and in a fine state of preservation. The surface of the shell is uniformly covered with a smooth shining enamel, showing no trace of dorsal opening."

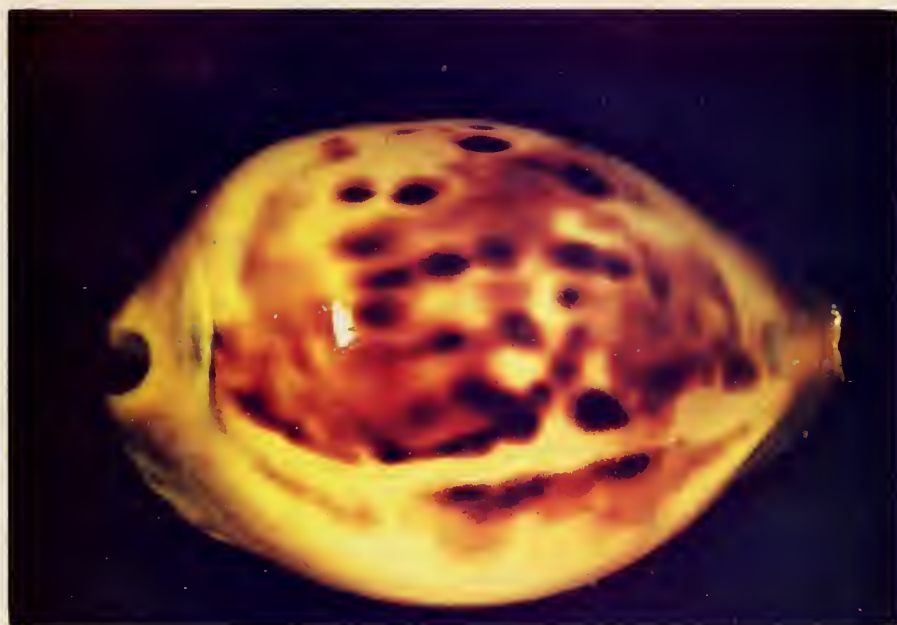


Textfigure 1. Map showing the known ranges of *Cypraea episema* and *Cypraea venusta*

Sowerby (1870) grudgingly used the Cox name *Cypraea thatcheri* in illustrating the species in *Thesaurus Conchyliorum*, saying "it would have been more graceful to have applied the [Gaskoin] manuscript name." His colored illustration is an adequate representation of *C. venusta*, and is the type figure for the species. From his statement about the manuscript name it would appear that it was probably the elder Sowerby who described the species originally, and that the younger Sowerby was not aware of this earlier paper by his father.

Weinkauff (1881) likewise faithfully pictured *Cypraea venusta* in his illustration of "*C. thatcheri*". He converted the Cox measurements from inches to millimeters, as: L. 75 mm., W. 46 (50) mm., H. 42 mm.

Brazier (1882), referring to *Cypraea thatcheri*, gave the measurements as "Length 3 inches, width 1 1/2 inches", and corrected the type locality to "Cervantes Island, west coast of Australia, not Dampier's Archipelago as first given by Mr. Thatcher." This seems to be the southernmost locality record presently known for *C. venusta*. Brazier's reasons for changing the measurements of the type specimen are not known, nor did he state the facts on which he



Cypraea (Zoila) venusta SOWERBY, 1846

based his decision to change the type locality some 23 years after the specimens were collected, and 13 years after Cox cited the Dampier Archipelago. However, according to current practice, his citation of Cervantes Island as the type locality for C. venusta must remain as valid until it has been correctly revised. It would seem that a locality somewhat to the north of this point might be more typical, but much additional collecting data will be necessary before any attempt should be made to change the type locality again.

Jousseume (1884), in establishing Zoila as a genus, designated Cypraea scottii Broderip, 1831 (= C. friendii Gray, 1831) as the type species, further designating only C. thersites Gaskoin, 1848, and C. marginata Gaskoin, 1848, to complete the genus. Cypraea thatcheri Cox (= C. venusta Sowerby) was referred at this time to another genus, Trona Jousseume, 1884.

Roberts in Tryon (1885) cited Cypraea venusta with a brief description and a reproduction of the type figure, stating "Dampier's Is., West Australia" as its type locality, apparently overlooking the comment by Brazier mentioned above. This is the earliest mention of the name C. thatcheri as a synonym of C. venusta. Roberts erroneously referred to the 1847 publication in the *Annals and Magazine of Natural History* as the earliest date instead of the 1846 Linnean Society paper. While evidently using Sowerby's type figure to illustrate C. venusta in the *Manual of Conchology*, Roberts' brief description employs terms which now seem more applicable to a typical specimen of C. episema: "base white, teeth thick and faint purplish white."

Melvill (1888) followed Jousseume's assignment of Cypraea venusta to Trona and compared it with C. (Trona) stercoraria Linnaeus, 1758. However, it is easy to recognize, even by a cursory comparison of their ventral surfaces, that these species belong in different subgenera. The only recognizable similarity is possibly the general bulbous appearance of each when only the dorsal aspects are considered. Melvill published the name "C. roseopunctata Sb. MSS." in this paper as a synonym of C. venusta, and C. roseopunctata thereby became a nomen nudum.

In 1889 Cox unknowingly described and illustrated a typical specimen of the species that later became Cypraea episema Iredale, 1939, erroneously referring to it as C. venusta Sowerby. In this paper he acknowledged that his C. thatcheri was a synonym of C. venusta, but he

seems not to have realized that the specimen he was discussing was misidentified. Cox named the type locality as Cape Naturaliste, "where it was washed on shore with the animal in it." It is a curious coincidence that he added, "It is so unlike the type specimen [of C. venusta] that when I first saw it lying in a case of exhibits in the Melbourne Exhibition I mistook it for Cypraea thersites, having a view of its dorsal surface only, but a moment's handling of it at once revealed its true nature, unlike as it is to the type." It is this Cox paper that Iredale later cited for the original description of C. episema.

A paper by Iredale (1935) mentions a label list of Cypraeidae privately printed by Cox in 1889. I have not seen this list, but it is apparent that a varietal name "brunea" was applied therein to the species Cox had described earlier in the same year. Iredale assumed that brunea was a misspelling for brunnea, but it seems appropriate to list it here in the synonymy according to Cox' original spelling.

{Ed. note: The following was received from Dr. Myra Keen—

'Stanford University has a copy of the Cox list. Perhaps this is a later printing. It is entitled, "List of Cypraea as arranged by S. Ramond [sic] Roberts in Tryon's *Manuel [sic] Conchology*, intended for facilitating exchanges and labelling specimens in the collection of James C. Cox, M. D., Craig Crook, Pitt Street, St. Leonards, New South Wales, 1891." It is also marked, "For private circulation only," which is imprinted in different type style above the title.

'On page 6, under Group C, "Shell smooth, spotted, spots extending over the base" is the entry:

" <u>Cypraea Venusta</u> , Sowerby	...	...	...	176
= <u>Cypraea Thatcheri</u> , Cox	...	...	...	177
Var. <u>Cypraea Brunea</u> , Cox	...	...	...	added
(P. L. S. N. S. W.)"				

Hidalgo (1907) was the first to note specific differences between the forms we now refer to as Cypraea venusta and C. episema. He had seen the specimen of C. venusta in the Dautzenberg Collection, and thought it was possibly the same shell figured by Cox in 1869 as C. thatcheri. It was his opinion that the Sowerby 1870 figures of C. venusta did not represent the same species and pointed out certain differences in color pattern and dentition. He noted the varietal name brunea that had been applied by Cox, properly relegating it to synonymy (it was preoccupied by at least two earlier species). Hidalgo, however, did not give a new name to this different form, as he might well have done.

Gatliff (1916) described what he called a variety of Cypraea venusta, applying the name "var. bakeri." He regarded it as subspecifically different because "two faintly distinguishable white bands cross the dorsum, one being

narrower and almost central, the other at the anterior is rather broader; the remainder of the dorsum is tinted with flesh color." Gatliff illustrated his specimen well; from this figure and his description there is little doubt that he had an immature specimen of *C. venusta* at hand. Therefore, his variety has correctly been referred to the synonymy of that species. It is not known what has become of this specimen.

Schilder (1932) cited the various references and synonyms of *Cypraea venusta* appearing in the literature before that date.

Schilder & Schilder (1938) placed the species in the genus *Zoila*, apparently for the first time. They mentioned *Cypraea thatcheri* as a synonym, saying it is characterized by the white base and pale pink sides, giving its dentition formula as S. 5-6; T. 10:44-5, citing collecting stations N. W. Australia, Dampier Archipelago, and Cape Naturaliste, and listing it as rare.

Iredale (1935) cited the 1847 reprinting of the Sowerby paper as the original description of *Cypraea venusta*, mentioned *C. thatcheri* Cox, 1869, as a synonym, and "*C. venusta* Cox, 1889" as a variety, giving the respective type localities mentioned by each author. This was the second time notice had been taken that a different species might be the basis for the second Cox figure, but Iredale merely mentioned it at this time.

Four years later Iredale (1939) first applied the name *Cypraea episema* to Cox' "variety." He did not redescribe it, referring instead to the 1889 Cox work, but as this direct reference with its accompanying figure (see Plate 3, Figs. 1a, 1b) constitutes a valid description according to the rules of the International Commission on Zoological Nomenclature, the name will stand as valid. The fact that for most collectors the original description has been difficult to obtain is probably responsible, at least in part, for some of the confusion connected with this species.

Steadman & Cotton (1946) provided a complete itemized list of species and subspecies in the genus *Zoila*, referring *Cypraea venusta* and *C. episema* to subspecific rank under *C. thersites thersites* Gaskoin, 1848. This decision

will be referred to again in this paper.

Schilder & Schilder (1952) provided the first complete modern discussion of *Cypraea venusta*, though there is no illustration in their paper of the specimen discussed (see Plate 4, Figs. 1 to 3). They mentioned it as very rare, from the Dampierian Region; the dentition formula was given as 75 (66) 17:12. The remainder of this note is quoted here in full: "Dampier. (Sowerby and Fulton): 1 ex: 74 (63) 17:12 (25 labial and 15 collumellar [sic] teeth); dorsum pale pink, with reddish orange spots, which are different in size, but rather round and not confluent, extremities greyish pink, sides pinkish white, base white, but fulvous along the margins. Dautzenberg's label runs as follows: 'Cet exemplaire a été figuré in Proc. Zool. Soc. London, 1869, pl. 26, fig. 1', therefore one would think it to be the holotype of *thatcheri* Cox. This figure, however, which is reproduced by Roberts in Tryon, Man. of Conch., 7, pl. 10, fig. 44 and 45 (1885) does not quite agree with Dautzenberg's shell: the arrangement of the dorsal spots is different, as is the number of teeth (24 labial, 14 columellar teeth), and all features of the anterior extremity, especially regarding the terminal ridge, which is obsolete in Roberts' figure, but distinct and followed by a smaller intercalated denticle in Dautzenberg's shell; therefore, Dautzenberg's shell can be regarded at most as the paratype mentioned by Cox (Proc. Zool. Soc. London, 1869, p. 358, 1869).

"This species, bought by Dautzenberg [March 12, 1904] for £24/--/--, is extremely rare; we have seen but one shell each in the British Museum and in coll. Saul (Cambridge), and very few other specimens have been collected in North Western Australia."

In 1956, Allan placed the two similar species, *Cypraea venusta* and *C. episema*, in different categories, *C. venusta* as a full species and *C. episema* as a subspecies of *C. thersites* Gaskoin, 1849 (sic). *Cypraea venusta* cannot be a subspecies of *C. thersites*, notwithstanding this and the earlier decision by Steadman & Cotton; *C. venusta* has two years' priority over the latter name, though Allan points out that she and Iredale regard both *C. venusta* and *C. episema* as subspecies of *C. thersites*. If this line

Explanation of Plate 2

- Figures 1a and 1b. *Cypraea venusta* SOWERBY, 1846. Hypotype No. 1, ex C. N. Cate Collection
 Figures 2a and 2b. *Cypraea episema* IREDALE, 1939 Hypotype No. 1, ex Am. Museum of Natural History Collection
 Figures 3a and 3b. *Cypraea episema* IREDALE, 1939. Hypotype No. 2, ex E. L. Fobes Collection

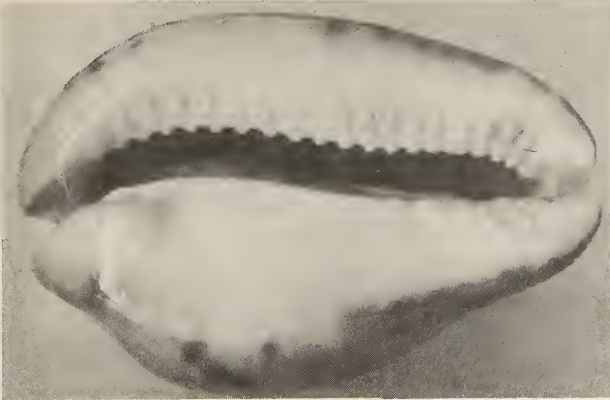


Figure 3 a

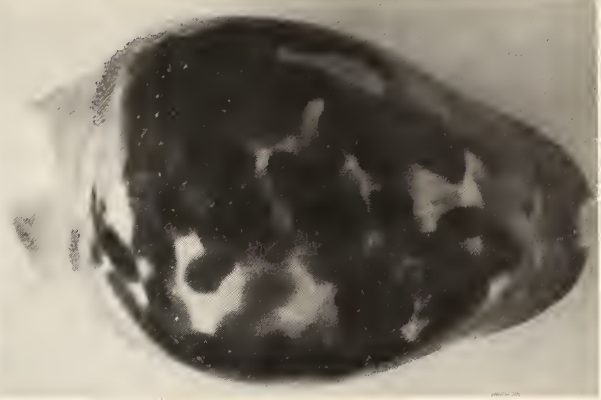


Figure 3 b

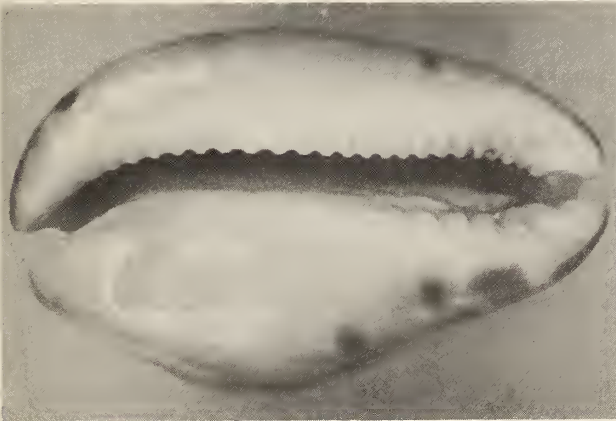


Figure 2 a

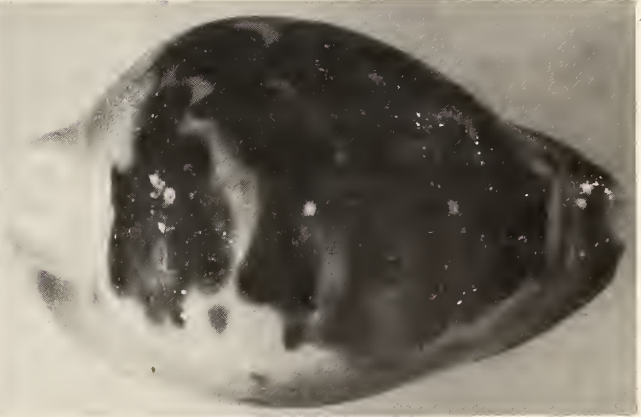


Figure 2 b



Figure 1 a

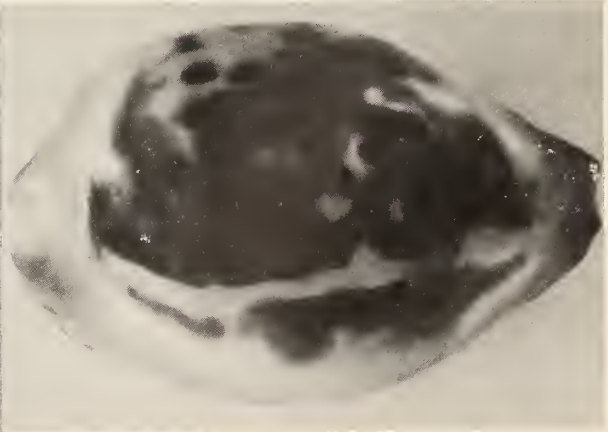


Figure 1 b

